UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/665,952	09/21/2000	Yoshiyuki Sogawa	32405W047	9483

7590 12/19/2003	EXAMINER
Beveridge DeGrandi Weilacher & Young LLP	SELBY, GEVELL V

ART UNIT	PAPER NUMBER
2615	

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	09/665,952	SOGAWA, YOSHIYUKI
	Examiner	Art Unit
	Gevell Selby	2615

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application)
since a specific reference was included in the first sentence of the specification or in an Application Data Sheet.
37 CFR 1.78.

    a)☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific
reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *3,4* .

4)☐ Interview Summary (PTO-413) Paper No(s). _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on
sale in this country, more than one year prior to the date of application for patent in the United States.

2.   **Claims 1 - 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Tanigawa**

et al., US 5,915,033.

        In regard to claim 1 Tanigawa et al., US 5,915,033, discloses a stereo matching

apparatus (see figure 1a) comprising:

        "a stereo camera system (see figure 1a, element 10) for taking pictures of a

predetermined area and producing first and second images of the predetermined area(see

column 3, lines 63-65);

        a memory (see figure 1b, elements ID1 and ID2) for storing first image data

within a reference pixel region in the first image and second image data on a horizontal

line in the second image, the horizontal line being corresponding to a vertical position of

the reference pixel region in the first image (see column 3, lines 63-65);

        an address generator (see figure 1b, element 40) for setting a search range for a

stereo matching and instructing to read out from said memory a part of the second image

data which is within the search range and the first image data within the reference pixel

region see column 4, lines 10- 15); and

a stereo matching unit (see figure 1b, element 50) for identifying a correlated

destination of the reference pixel region by the stereo matching based on the part of the

second image data which is within the search range and the first image data within the

reference pixel region which are read out from said memory and calculating a parallax of

the reference pixel region based on the correlated destination of the reference pixel region

(see column 8, lines 44-55),

wherein said address generator corrects a location of the search range for the

reference pixel region based on the amount of deviation of an infinite distance

corresponding point with respect to a horizontal position of the reference pixel region

(see column 4, lines 22-48)."

In regard to claim 2, Tanigawa et al., US 5,915,033, discloses the stereo matching

apparatus as recited in claim1, "wherein said address generator shifts the location of the

search range (WD2) in the same direction as a direction of the deviation of the infinite

distance corresponding point with respect to the horizontal position of the reference pixel

region (see column 4, lines 10-15)."

In regard to claim 3, Tanigawa et al., US 5,915,033, discloses the stereo matching

apparatus as recited in claim 2, "wherein said address generator shifts a starting point of

the search range (WD2) in the same direction as the direction of the deviation of the

infinite distance corresponding point (see column 4, lines 10-15)."

It is inherent that when the search range is shifted the starting point is included in

that shift.

In regard to claim 4, Tanigawa et al., US 5,915,033, discloses the stereo matching apparatus as recited in claim 2, "wherein said address generator shifts a end point of the search range (WD2) in the same direction as the direction of the deviation of the infinite distance corresponding point (see column 4, lines 10-15)."

It is inherent that when the search range is shifted the end point is included in that shift.

In regard to claims 5, 6, 7, and 8 Tanigawa et al., US 5,915,033, discloses the stereo matching apparatus as recited in claims 1, 2, 3, and 4, "wherein said address generator identifies the amount of correction of the search range (bs) in relation to the amount of deviation of the infinite distance corresponding point (see column 4, lines 38-39 and 49-55)."

In regard to claim 9, Tanigawa et al., US 5,915,033, discloses the stereo matching apparatus as recited in claim 2, further comprising:

"a correction value memory for storing a correction value for correcting the location of the search range in relation to a location of the reference pixel region in the first image (see column 4, lines 49-55);"

It is inherent that the distance detection circuit has a memory buffer that stores the calculated correction value until it is used to calculate the parallax.

"wherein said address generator sets the location of the search range for the reference pixel region based on the location of the reference pixel region and the correction value stored in said correction value memory for said location of the reference pixel region (see column 4, 40-48)."

The distance detection circuits select the search range, WD2, that corresponds to the reference image with the reference point for which it is searching. The distance detection circuits do not need to the correction value to make the selection because they perform the same function by searching all the search ranges in parallel (see column 4, lines 14-21).

In regard to claim 10, Tanigawa et al., US 5,915,033, discloses the stereo matching apparatus as recited in claim 3, further comprising:

"a correction value memory for storing a correction value for correcting the location of the search range in relation to a location of the reference pixel region in the first image (see column 4, lines 49-55);"

It is inherent that the distance detection circuit has a memory buffer that stores the calculated correction value until it is used to calculate the parallax.

"wherein said address generator sets the starting point of the search range for the reference pixel region based on the location of the reference pixel region and the correction value stored in said correction value memory for said location of the reference pixel region (see column 4, lines 40 – 48)."

The distance detection circuits select the search range, WD2, that corresponds to the reference image with the reference point for which it is searching. The distance detection circuits do not need to the correction value to make the selection because they perform the same function by searching all the search ranges in parallel (see column 4, lines 14-21).

In regard to claim 11, Tanigawa et al., US 5,915,033, discloses the stereo matching apparatus as recited in claim 1 "wherein said stereo camera system comprises a pair of stereo cameras mounted on a vehicle (see column 1, lines 20-21), the pair of stereo cameras taking pictures of scenes outside of the vehicle (see column 1, lines 25-32), and said stereo matching unit calculates a distance to an object outside the vehicle on the basis of the parallax of the reference pixel region (see column 1, lines 20-25)."

It is inherent that the camera is mounted to the vehicle in order to capture the images of the vehicles around the car to prevent collisions.

In regard to claim 12, Tanigawa et al., US 5,915,033, discloses a stereo matching method comprising:

"taking pictures of a predetermined area and producing first and second images of the predetermined area (see figure 3, lines 63-67);

identifying a reference pixel region (WD1) in the first image (see figure 4, lines 1-3);

identifying a search range (WD2) for the reference pixel region in the second image (see figure 4, lines 1-3);

correcting a location of the search range for the reference pixel region based on the amount of deviation of an infinite distance corresponding point with respect to a horizontal position of the reference pixel region (see column 4, lines 31-47); and

identifying a correlated destination of the reference pixel region by searching through the search range (see column 4, lines 40-45)."

In regard to claim 13, Tanigawa et al., US 5,915,033, discloses the stereo matching method as recited in claim 12, "wherein said step of correcting the location of the search range shifts the location of the search range in the same direction as the direction of the deviation of the infinite distance corresponding point with respect to the horizontal position of the reference pixel region (see column 4, lines 40-55)."

In regard to claim 14, Tanigawa et al., US 5,915,033, discloses the stereo matching method as recited in claim 13, "wherein said step of correcting the location of the search range shifts a starting point of the search range in the same direction as the direction of the deviation of the infinite distance corresponding point with respect to the horizontal position of the reference pixel region (see column 4, lines 40-55)."

It is inherent that when the search range is shifted the starting point is included in that shift.

In regard to claims 15-19, Tanigawa et al., US 5,915,033, discloses the stereo matching method as recited in claims 13-15, "wherein said step of correcting the location of the search range shifts a end point of the search range in the same direction as the direction of the deviation of the infinite distance corresponding point with respect to the horizontal position of the reference pixel region (see column 4, lines 40-55)."

It is inherent that when the search range is shifted the end point is included in that shift.

In regard to claim 20, Tanigawa et al., US 5,915,033, discloses the stereo matching method as recited in claim 12, further comprising:

"calculating a distance to an object outside a vehicle on the basis of the correlated destination of the reference pixel region, wherein said step of taking pictures of the predetermined area takes pictures of scenes outside of the vehicle (see column 1, lines 23-39)."

In regard to claim 21, Tanigawa et al., US 5,915,033, discloses the stereo matching method as recited in claim 12, further comprising:

"taking picture of a screen by a pair of stereo cameras and producing third and fourth images of the screen, said screen being drawn a first vertical line and a second vertical line at an interval equal to a baseline of the stereo cameras (see column 3, lines 15-20);

identifying a deviation of a position of the second vertical line shown on the fourth image with respect to a position of the first vertical line shown on the third image (see column 3, lines 15-25) ; and

calculating an infinite distance corresponding point corresponding to each position on the first vertical line shown on the third image on the basis of the deviation of the position of the second vertical line, wherein said step of correcting the location of the search range uses the infinite distance corresponding point thus calculated as the infinite distance corresponding point corresponding to the horizontal position of the reference pixel (see column 3, lines 9-25 and column 4, 30-55)."

In regard to claim 22, Tanigawa et al., US 5,915,033, discloses a method of calculating an infinite distance corresponding point, the method comprising:

"taking picture of a screen by a pair of stereo cameras and producing first

and second images of the screen (see column 3, lines 49-67), said screen being

drawn a first vertical line and a second vertical line at an interval equal to a

baseline of the stereo cameras (see column 3, lines 15-16);

identifying a deviation of a position of the second vertical line shown on

the second image with respect to a position of the first vertical line shown on the

first image (see column 4, lines 10-15); and

calculating an infinite distance corresponding point corresponding to each

position on the first vertical line shown on the first image on the basis of the

deviation of the position of the second vertical line (see column 4, lines 31-55)."

In regard to claim 23, Tanigawa et al., US 5,915,033, discloses a stereo matching

apparatus comprising:

"a stereo camera system for taking pictures of a predetermined area and

producing first and second images of the predetermined area (see column 3, lines

49-67);

a reference pixel region identifying unit (distance detection circuit) for

identifying a reference pixel region (WD1) in the first image (see column 4, lines

40-48);

a search range identifying unit (distance detection device) for identifying a

search range for the reference pixel region (WD2) in the second image (see

column 3, line 63 to column 4, line 9) ;

a correction unit (distance detection device) for correcting a location of

the search range for the reference pixel region based on the amount of deviation

of an infinite distance corresponding point with respect to a horizontal position of

the reference pixel region (see column 4, lines 31-48); and

a correlated destination identifying unit (distance detection device) for

identifying a correlated destination of the reference pixel region by searching

through the search range (see column 4, lines 49-55)."

Conclusion

3.   The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure. The following art discloses a stereo camera system:

US 5,530,420,

US 5,535,144,

US 5,410,346,

US 5,929,784,

Us 5,719,954.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Gevell Selby whose telephone number is 703-305-8623. The

examiner can normally be reached on 8:00 A.M. - 5:30 PM (every other Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Vu Le can be reached on 703-308-6613. The fax phone number for the organization

where this application or proceeding is assigned is 703-872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the receptionist whose telephone number is 703-305-4700.

gvs

VU LE
PRIMARY EXAMINER